

ABSTRACT

- 5 The invention relates to semiconductor device fabrication and more specifically to
a method and material for forming of shallow trench isolation structures in
integrated circuits. A silica dielectric film is formed by preparing a composition
comprising a silicon containing pre-polymer, optionally water, and optionally a
metal-ion-free catalyst selected from the group consisting of onium compounds
10 and nucleophiles. The substrate is then coated with the composition to form a
film. The film is then crosslinked to produce a gelled film. The gelled film is
then heated at a temperature of from about 750 °C to about 1000 °C for a duration
effective to remove substantially all organic moieties and to produce a
substantially crack-free silica dielectric film.